internationale regroupant des experts dans la prise en charge de la spasticité. Ces recommandations diffèrent parfois des autorisations de mise sur le marché des différents pays et diffèrent également d'un pays à l'autre au sein de l'union européenne. Ces nuances peuvent concerner soit les différentes lignes de traitement, soit les dosages utilisés des différentes thérapeutiques pharmacologiques, soit les muscles ciblés. Cette communication visera à mettre en évidence les points communs et les différences existant selon les pays en termes de prise en charge de la spasticité.

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Saisir les objets avec des mains greffées : une analyse cinématique

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Mots clés : Allogreffe de main ; Préhension ; Cinématique ; Contrôle visuomoteur ; Transport-saisie

Depuis la première allogreffe de main chez l'homme en 1998, plus de 50 patients amputés des membres supérieurs ont bénéficié de cette intervention, bilatérale dans 25 cas. De ces procédures chirurgicales et immunosupressives innovantes résulte une récupération fonctionnelle satisfaisante permettant aux patients de retrouver leur autonomie dans la vie quotidienne malgré la persistance de déficits sensitifs et de limitations des amplitudes articulaires. Les caractéristiques cliniques analytiques et fonctionnelles des mouvements de préhension ont été partiellement décrites chez ces sujets. Un remodelage plastique du cortex sensorimoteur induit par la greffe a été documenté en neuro-imagerie fonctionnelle, mais la structure molaire des mouvements de préhension visuellement guidés n'a jamais été étudiée. Nous rapportons la première analyse cinématique des performances de préhension de cinq patients français porteurs d'une allogreffe bilatérale de main. Le délai entre l'amputation et la greffe variait de deux ans et demi à cinq ans, et la transplantation lors de notre étude datait de trois à 13 ans. Les patients ont accompli une tâche de transport-saisie d'un objet cylindrique, placés dans leur hémi-espace droit ou gauche, avec trois diamètres différents de cylindre testés. Les deux mains greffées ont été testées séparément, et les performances ont été comparées à celle d'un groupe de sujets témoins appariés en âge, genre, et morphologie des membres supérieurs. Les résultats montrent une augmentation significative de l'ouverture maximale des doigts parallèle à l'augmentation du diamètre du cylindre chez les patients comme chez les contrôles, indiquant une préservation des principales caractéristiques du contrôle visuomoteur de la préhension chez les allogreffés. En revanche, la structure molaire des mouvements des patients est légèrement altérée avec un allongement de la phase finale du mouvement lors de la stabilisation de la pince pouce-index sur l'objet, alors que les phases précoces des composantes de transport et de saisie sont respectées. Ces données suggèrent une « récupération » remarquablement bonne du schéma de préhension après une allogreffe bilatérale de main, notamment concernant le calibrage de la pince selon la taille de l'objet, et indiquent également des difficultés d'exécution de la saisie possiblement dues aux déficits neuro-orthopédiques périphériques résiduels.

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Oral communications

English version

CO11-001-e

Auditory environment: A challenge for brain-damaged patients

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Keywords: Brain damage; Auditory cognition; Auditory complaint

Hemispheric damage is often accompanied by auditory complaints, even in the absence of significant anomalies on tone audiometry. Frequently the complaint is general, as not to bear up in noisy surroundings or not to hear well. In some cases the complaints are more specific, as not to recognize sounds or not be able to localize them (Clarke and At, in press). Whereas specific complaints generally reflect well the specific deficits of sound recognition and/or sound localization, the non-specific ones can be associated with a variety of auditory cognitive deficits and reflect the dysfunction of specific auditory processing networks. Selective deficits in sound localization are sometimes associated with the complaint of not hearing well; this is striking in patients with right hemispheric lesions who complain of not hearing well by the left ear (Spierer et al., 2009). Deficits in the implicit use of auditory spatial cues for the segregation of sound objects, while sound localization is preserved, are often assimilated by discomfort in noisy surroundings (Duffour-Nikolov et al., 2011). Both types of auditory neglect, characterized by attentional bias or by distortion of the auditory space, are often assimilated to not hearing well or to auditory discomfort (Bellmann et al., 2001; Spierer et al., 2007). In few cases of auditory discomfort a thorough auditory cognitive investigation did not reveal any deficits in the above listed functions. In an ongoing fMRI study we have demonstrated in these cases anomalies in the attentional modulation of neural activity in the primary auditory cortex. Thus, the auditory complaint of a brain-damaged patient requires apart from an ENT also an auditory cognitive examination. Case studies suggest that specific interventions at the level of the deficit may alleviate the auditory symptoms and may offer thus a possibility for treatment.

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Understanding dynamics of motor recovery after stroke

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Keywords: Stroke; Recovery; Motor

The present lecture will address the current knowledge about the predictability of the time course of body functions and activities post-stroke. Presently, there is growing evidence that the natural logarithmic pattern of functional recovery can be modified by intensive task-oriented practice, preferably initiated within 6 months after stroke. However, the impact of practice on learning-dependent and intrinsic, spontaneous mechanisms of neurological recovery is still poorly understood. Several, probably interrelated mechanisms, have been identified that drive recovery after stroke, such as (1) salvation of penumbral tissue in the first days to weeks after stroke onset; (2) alleviation of diaschisis; (3) homeostatic and learning-dependent (Hebbian and non-Hebbian) forms of neuroplasticity as well as (4) behavioral compensation strategies. These mechanisms underlying recovery are highly interactive and operate in different, sometimes limited time-windows after stroke. In this presentation, a hypothetical phenomenological model for understanding skill reacquisition after stroke will be presented. Subsequently, the importance of this model will be emphasized in order to improve our knowledge about the longitudinal association of what and how patients learn when they show functional improvement after stroke.

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Predicting Barthel Index and Nottingham Extended Activities of Daily Living score six months after stroke: Further results from the European multi-center CERISE study

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Keywords : Stroke; Prediction; Barthel Index; Nottingham Extended ADL
Introduction.– Current prediction models are mostly based on a limited number of participants recruited from a single setting, limiting generalizability of findings. The CERISE study (Collaborative Evaluation In Stroke Rehabilitation across Europe) investigated in-patient stroke rehabilitation in 532 people with stroke in four European rehabilitation centers. The aim of this study was to determine predictors of personal and extended activities of daily living at six months after stroke.
Material and methods.– People were recruited from centers in Belgium, Germany, United Kingdom and Switzerland. Data were collected on admission and at two and six months post stroke. In total, 26 variables were recorded comprising patient- and stroke-specific information, comorbidities, motor and functional capabilities and socio-economic factors. We conducted a multivariate logistic regression, predicting personal activities of daily living (ADL) (Barthel Index (BI) score; good outcome = BI≥95/100) and extended ADL (Nottingham Extended ADL (NEADL) score; good outcome = NEADL≥12/22) at six months. Sensitivity and specificity of the prediction models was calculated.
Results.– The model predicting good BI outcome ($n = 468$) included being male, having a higher BI at two months and better arm function at two months post stroke ($P/(1-P) = e^{-7.32 + 0.09\,(\text{Barthel Index score at 2 months}) - 0.77\,(\text{gender; male=0/female=1}) + 0.07\,(\text{RMA-Arm(*) at 2 months})}$). The prediction equation showed a sensitivity of 81% and a specificity of 89%. The model predicting good NEADL outcome ($n = 465$) included being male, having a higher BI score at two months and having a greater improvement in arm function from admission to two months post stroke ($P/(1-P) = e^{-6.004 + 0.08\,(\text{Barthel Index score at 2 months}) - 1.32\,(\text{gender; male=0/female=1}) + 0.04\,(\text{RMA-Arm(*) difference between 2 months and intake})}$). Sensitivity and specificity of the model was 80% and 88%, respectively.
Discussion.– Gender, Barthel Index score and arm function score determined outcome at six months after stroke with both good sensitivity and specificity. To the best of our knowledge, this is the largest, European, multi-center study that has been conducted in this area, with applicable prediction equations for the clinical setting.

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National and European consensus in spasticity management

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Management of spasticity has changed significantly during the last two decades, particularly through the contribution of new therapies such as botulinum toxin or the development of surgical techniques in some countries. Licensed indications were granted to pharmaceutical industry for different therapies at a national or European level but are sometimes guided by complex logics. In parallel, consensus meeting and recommendations of good practice were organised at a national, European or international level including experts in the field of spasticity management. These recommendations are sometimes different from licensed indications of the different countries and from a country in the other one within the European union. Theses nuances can concern the different line of treatment, dosages of the various pharmacological therapies, or the targeted muscles. The goal of this talk will be to show the common points and the differences existing between the different countries in the field of spasticity management.

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CO11-005-e

Grasping objects with allografted hands: A kinematic study

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Keywords : Hand allograft; Prehension; Kinematic; Visuo-motor control; Reach-to-grasp
Since the first human hand allograft in 1998, more than 50 patients around the world have received a hand allograft several years after an upper limb amputation, including about 25 cases of bilateral hand transplantation. Clinical results of these innovative surgical and immunosuppressive procedures are globally positive, with good functional outcome allowing patients to retrieve autonomy in daily life, in spite of some persistent impairment both at the level of touch sensation and range of motion. The analytic and functional features of prehension movements have been tentatively described for these subjects from a clinical perspective. The graft-induced plastic remodeling in the sensory-motor cortex has been documented by functional neuroimaging, but the molar structure of visually-guided prehension movements has never been investigated. We report on the first kinematic study of prehension performance in five French bilateral hand allograft receivers. Patients had been transplanted from two and half to five years after amputation, and the delay between the graft and our assessment ranged from three to thirteen years. Grafted patients were asked to reach and grasp one of three cylinders of different sizes, located either on the left or right hemispace. Both grafted hands were separately assessed, and performance was compared with that of a group of control subjects matched for age, gender and upper limb morphology. Results showed a significant increase of the maximum finger aperture paralleling the increase in object size in patients as in control subjects, which indicates that critical features of the visuomotor control of prehension are spared in allograft receivers. By contrast, the molar structure of the movement was somewhat altered by a lengthening of the final phase of the movement when the stable finger grip on the object is achieved, whereas the earlier phases of reaching and grasping components were preserved. These data suggest a remarkably good 'recovery' of the pattern of prehension after a bilateral hand allograft, especially concerning the scaling of the pinch grip according to the object size, and also indicate some difficulties may persist in grasping object execution, possibly due to residual peripheral neuro-orthopedic deficiencies.

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Table ronde

Version française

TR01-001-f

Perspectives européennes de neuroréadaptation

Pr Stephanie Clarke WFNR président (6 mn).
Pr Volker Hoemberg, WFNR et EFNR Secretary (6 mn).
Pr Heinrich Binder, EFNR président (6 mn).
Pr Gert Kwakkel, Deutch Society of Neurorehabilitation, (6 mn).
Pr Caterina Pistarini, Italian Society of Neurorehabilitation (6 mn).
Pr T. Lejeune, Belgian Forum of Neurorehabilitation (6 mn).
Pr Dominic Pérennou, French Forum of NeuroRehabilitation (6 mn).
General discussion 40 mn.

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